

CLAIMS

1. A lubricant mapping system for evaluating the uniformity of deposited lubricant on a finished magnetic disk comprising
film optics including an illumination system for producing a polarized light beam and a detection system for measuring the intensity of polarized light reflected from a disk under test as to provide the capability to analyze various characteristics of reflected light from the disk;
a test stand including a rotatable spindle to rotate and support a disk under test;
means to bring about relative movement between a disk on said test stand and said film optics;
means to rotate the disk on said spindle at a selected speed of more than 100 RPM and to measure the angular position of the disk at an angular position accuracy about 0.2 degrees or less;
an automatic shutter system to protect said film optics from contamination of solvent during a lubrication treatment of the disk;
a programmable dispenser/titrator to pump lubricant onto a disk; and,
a computer to interrelate the spinning of the disk and the treatment and data processing of the disk surface in a determination of map of and the qualities of the lubricant layer on the surface of the disk.
2. The process of generating a lubricant uniformity map of the lubrication layer of a hard magnetic disk comprising:
spinning a hard disk in relation to an optical instrument capable of measuring reflected light from polarized light fed to the surface of said spinning disk;
making a first scan of the disk surface;
protect the optical instrument from lubricant materials on the surface of the disk through the use of a shutter mechanism;

performing a de-lubrication process by spin-rinsing the disk by feeding a lubricant solvent onto the surface of a spinning disk to remove the non-bonded lubricant from the surface of the disk;

determining that the optical instrument is ready for scanning by opening the shutter mechanism;

making a second scan of the disk surface with the optical instrumentation; and, generate a map of the lubricant layer on the surface of disk by subtracting said first scan from said second scan made with the optical instrumentation.

3. The system of claim 1 in which the shutter system is a linear shutter system.
4. The shutter system of claim 1 in which the shutter system is a rotary shutter system.
5. The system of claim 1 in which the dispenser/titrator is a bottle-top syringe style dispenser/titrator.
6. The system of claim 1 in which the dispenser/titrator is a peristaltic pump style dispenser/titrator.
7. The system of claim 1 in which the dispenser/titrator is an air driven programmable dispenser/titrator.
8. The lubricant mapping system of claim 1 including a collet chuck for protecting the spindle from contamination by the solvent.
9. The process of claim 2 in which the lube is spin coated onto the disk.

10. The system of claim 1 in which the disk is caused to rotate at a speed of up to 30,000 RPM.
11. The system of claim 1 in which the angular position measurement accuracy is about 0.1 degree.
12. The system of claim 1 in which said film optics determines at least two measurements from the group consisting of Phase Contrast, Enhanced Phase Contrast and/or Differential Phase Contrast data
13. .A lubricant mapping system for evaluating the uniformity of deposited lubricant on a finished magnetic disk comprising
film optics including an illumination system for producing a polarized light beam and a detection system for measuring the intensity of polarized light reflected from a disk under test as to provide the capability to analyze various characteristics of reflected light from the disk;
a test stand including a rotatable spindle to rotate and support a disk under test;
means to bring about relative movement between a disk on said test stand and said film optics;
means to rotate the disk on said spindle at a selected speed of between 100 to 30,000 RPM and to control the angular position of the disk at an angular position accuracy of less than about 0.2 degrees;
an automatic shutter system to protect said film optics from contamination of solvent during a lubrication treatment of the disk;
a programmable dispenser/titrator to pump lubricant onto a disk; and,
a computer to interrelate the spinning of the disk and the treatment and data processing of the disk surface in a determination of map of and the qualities of the lubricant layer on the surface of the disk.

14. The system of claim 13 in which a first scan is made with lubricant on the disk and a second scan is made following flushing of the lubricant from the disk.
15. The system of claim 14 in which the second scan is subtracted from the first scan as to generate a map of the lubricant layer.